Amendments to the Claims

This listing of claims, if entered, will replace all prior versions and listings of claims in the present application.

Listing of Claims

1. (**Currently Amended**) A network device comprising:
a duplicate packet map (DPM), wherein
said DPM comprises a previous time interval field and a current time interval field;
a packet summary value (PSV) generator, wherein
said DPM is coupled to said PSV generator,
said PSV generator is configured to, responsive to receiving a packet,
extract data from said packet, and
calculate a PSV using said data from said packet, and
said DPM is configured to receive said PSV; and
a DPM bank, wherein
said DPM bank ~~**comprises a**~~ **is configured to store a** plurality of DPMs **by virtue of comprising a plurality of memory cells**, and
said plurality of DPMs comprises said DPM.

2. (Original) The network device of claim 1, wherein said DPM comprises:
a plurality of DPM fields.

3. (Original) The network device of claim 2, wherein
said DPM is configured to receive a packet summary value (PSV).

4. (Original) The network device of claim 3, wherein said DPM is implemented as a Bloom filter.

5. (Original) The network device of claim 3, wherein

a one of said DPM fields corresponds to said PSV.

6. (Original) The network device of claim 3, wherein
each of said DPM fields corresponds to a bit in said PSV.

7. (Original) The network device of claim 3, wherein
each of said DPM fields is configured to compare a value of a corresponding bit of said PSV with a value stored in said each of said DPM fields to generate an output, and
a value of each of said outputs indicates whether said value of said corresponding bit of said PSV matches said value stored in said each of said DPM fields.

8. (Original) The network device of claim 3, wherein
each of said DPM fields is configured to be addressed using said PSV, and
a value stored in a one of said DPM fields corresponding to a value of said PSV indicates whether said packet is said duplicate packet.

9. **(Currently Amended)** The network device of claim 1, ~~**further comprising**~~:
~~**a packet summary value (PSV) generator,**~~ wherein
~~**said duplicate packet map (DPM) is coupled to said PSV generator**~~
said PSV generator is configured to calculate said PSV using a cyclic redundancy check (CRC) calculation; and
said data from said packet is path-independent.

10. **(Currently Amended)** The network device of claim 9, wherein
~~**said PSV generator is configured to generate a PSV based on a packet received by said PSV generator, and**~~
~~**said DPM is configured to receive said PSV**~~
the data from said packet excludes header and trailer information.

11. (Original) The network device of claim 9, wherein said DPM comprises:
a plurality of DPM fields.

12. (Original) The network device of claim 11, wherein
a one of said DPM fields corresponds to said PSV.

13. (Original) The network device of claim 11, wherein
each of said DPM fields corresponds to a bit in said PSV.

14. (Original) The network device of claim 12, wherein said DPM is implemented as a Bloom filter.

15. (Cancelled)

16. (Cancelled)

17. (Previously Presented) The network device of claim 1, wherein
each of said DPMs is implemented as a Bloom filter.

18. (Previously Presented) The network device of claim 1, wherein
a first one of said DPMs is designated as a current DPM, and
a second one of said DPMs is designated as a previous DPM.

19. (Previously Presented) The network device of claim 1, wherein said DPM bank further comprises:
a DPM addressing unit coupled to said DPMs;
a selection unit coupled to said DPMs; and
a DPM control unit, coupled to control said DPM addressing unit, said DPMs and said selection unit.

20. (Original) The network device of claim 19, wherein
said DPM control unit is configured to select a first one of said DPMs as a current DPM and a second one of said DPMs as a previous DPM.

21. (Original) The network device of claim 20, wherein

said DPM control unit is configured to cause said DPM addressing unit to provide said PSV to said current DPM and said previous DPM; and

said DPM control unit is configured to cause said selection unit to select said current DPM and said previous DPM.

22. (Original) The network device of claim 20, wherein

said DPM control unit is configured to select said previous DPM as an inactive DPM and to clear said inactive DPM.

23. (Previously Presented) The network device of claim 1, further comprising:

a packet summary value (PSV) generator, wherein

said duplicate packet map (DPM) is coupled to said PSV generator.

24. (Original) The network device of claim 23, wherein said DPM bank further comprises:

a DPM addressing unit coupled between said PSV generator and said DPMs; and

a selection unit coupled to said DPMs.

25. (Original) The network device of claim 24, wherein said DPM bank further comprises:

a DPM control unit, coupled to control said DPM addressing unit, said DPMs and said selection unit.

26. (Original) The network device of claim 25, wherein

said selection unit is configured to generate a hit signal, and

said hit signal indicates that bit values of said PSV match bit values stored in corresponding locations in a one of said DPMs.

27. (Original) The network device of claim 9, wherein

said PSV generator is configured to generate a PSV based on a packet received by said PSV generator, and

said DPM is configured to receive said PSV.

28. (Original) The network device of claim 27, wherein

said DPM is further configured to indicate that said PSV matches a PSV stored in said DPM.

29. (Original) The network device of claim 28, wherein said PSV generator is configured to generate said PSV using a cyclic redundancy check computation.

30. (Original) The network device of claim 9, further comprising:
a packet processing unit, said packet processing unit comprising said PSV generator.

31. (Original) The network device of claim 30, further comprising:
a DPM bank, wherein
said DPM bank comprises said DPM,
said DPM bank is configured to generate a hit signal, and
said DPM bank is coupled to receive said PSV from said PSV generator and to provide said hit signal to said packet processing unit.

32. (Original) The network device of claim 31, wherein
said hit signal indicates that a value of said PSV matches a value stored in a one of said DPMs.

33. (Original) The network device of claim 31, wherein
said hit signal indicates that bit values of said PSV match bit values stored in corresponding locations in a one of said DPMs.

34. (Original) The network device of claim 31, wherein
said packet processing unit is configured to process said packet using said hit signal.

35. (Original) The network device of claim 31, wherein
said processing includes causing said packet processing unit to drop said packet based on said hit signal.

36. (**Currently Amended**) A method comprising:
generating a packet summary value (PSV), wherein

said generating said PSV comprises, responsive to receiving a packet,

extracting data from said packet, and

calculating said PSV using said data from said packet; and

determining if a field of a duplicate packet map (DPM) indicates **[[a]]** **the** packet is a duplicate packet, wherein said DPM is one of a plurality of DPMs included in a DPM bank and said determining uses **[[a]]** **said PSV,**

wherein ~~**packet summary value (PSV)**~~

~~**corresponding**~~ **said PSV corresponds** to said packet, and

said DPM comprises a previous time interval field **stored in a memory cell** and a current time interval field.

37. (Original) The method of claim 36, further comprising:

indicating said packet is said duplicate packet, if said determination determines said packet is said duplicate packet.

38. (Original) The method of claim 37, further comprising:

dropping said packet, if said packet is said duplicate packet.

39. (Previously Presented) The method of claim 37, wherein said determining comprises:

comparing said PSV to said DPM.

40. (Original) The method of claim 39, wherein

said determination is made by comparing a bit of said PSV with a bit stored in said field of said DPM, and

said indicating is performed if said bit of said PSV matches said bit stored in said field of said DPM.

41. (Original) The method of claim 40, further comprising:

setting said bit stored in said field of said DPM to a value of said bit of said PSV.

42. (Original) The method of claim 37, wherein said determining comprises:

selecting said field of said DPM based on said PSV.

43. (Original) The method of claim 42, wherein
said determination is made by selecting said field of said DPM based on a value of said PSV, and
said indicating is performed if a value stored in said field of said DPM indicates that said packet is said duplicate packet.

44. (Original) The method of claim 43, further comprising:
setting said value stored in said field of said DPM, if said packet is not said duplicate packet.

45. (Original) The method of claim 44, further comprising:
said generating said PSV **~~by generating~~ further comprises calculating** a cyclic redundancy check value based on **~~information~~ said data** in said packet**, wherein said data from said packet excludes header and trailer information, and said data from said packet is path-independent**.

46. (Cancelled)

47. (Previously Presented) The method of claim 37, further comprising:
selecting a first DPM of said plurality of DPMs as a previous DPM; and
selecting a second DPM of said plurality of DPMs as a current DPM.

48. (Original) The method of claim 47, further comprising:
determining if a field of said previous DPM indicates said packet is said duplicate packet, using said PSV; and
determining if a field of said current DPM indicates said packet is said duplicate packet, using said PSV.

49. (Original) The method of claim 48, further comprising:
indicating said packet is not said duplicate packet, if said field of said previous DPM indicates said packet is not said duplicate packet and said field of said current DPM indicates said packet is not said duplicate packet, and
indicating said packet is said duplicate packet, otherwise.

50. (Original) The method of claim 47, further comprising:
selecting said previous DPM as an inactive DPM;
selecting said current DPM as said previous DPM; and
selecting another DPM of said DPMs as said current DPM.

51. (Original) The method of claim 50, further comprising:
clearing said inactive DPM prior to said inactive DPM being selected as said current DPM.

52. (Original) The method of claim 50, wherein
said selecting said previous DPM as said inactive DPM, said selecting said current DPM as said previous DPM, and said selecting said another DPM of said DPMs as said current DPM are performed periodically.

53. (Original) The method of claim 52, wherein
a period of said performing periodically is such that said period is greater than an expected differential between duplicate packet arrivals and said period is less than a time between packet retransmissions.

54. (Original) The method of claim 52, wherein
a period of said performing periodically is configured to allow said inactive DPM to be cleared prior to said inactive DPM being selected as said current DPM.

55. **(Currently Amended)** A network device comprising:
a processor;
a computer readable medium coupled to said processor; and
computer code, encoded in said computer readable medium configured to cause said processor to:
generate a packet summary value (PSV), wherein
said computer code configured to cause said processor to generate said PSV comprises computer code configured to cause said processor to, responsive to receiving a packet,

extract data from said packet, and

calculate said PSV using said data from said packet, and

determine if a field of a duplicate packet map (DPM) indicates said packet is a duplicate packet, wherein said DPM is one of a plurality of DPMs included in a DPM bank and

said computer code configured to cause said processor to determine uses a ~~**a packet summary value (PSV)**~~ **said PSV,**

said PSV corresponds ~~**corresponding**~~ to said packet, and

said DPM includes a previous time interval field and a current time interval field.

56. (Original) The network device of claim 55, wherein said computer code is further configured to cause said processor to:

indicate said packet is said duplicate packet, if said computer code configured to cause said processor to determine determines said packet is said duplicate packet.

57. (Original) The network device of claim 56, wherein said computer code is further configured to cause said processor to:

compare said PSV to said DPM.

58. (Original) The network device of claim 56, wherein said computer code is further configured to cause said processor to:

select said field of said DPM based on said PSV.

59. (**Currently Amended**) The network device of claim 58, wherein said computer code is further configured to cause said processor to:

generate said PSV by virtue of being configured to ~~**generate**~~ **calculate** a cyclic redundancy check value based on ~~**information**~~ **said data** in said packet**, wherein said data from said packet excludes header and trailer information, and said data from said packet is path-independent**.

60. (Cancelled)

61. (Previously Presented) The network device of claim 55, wherein said computer code is further configured to cause said processor to:

select a first DPM of said DPMs as a previous DPM; and

select a second DPM of said DPMs as a current DPM.

62. (Original) The network device of claim 61, wherein said computer code is further configured to cause said processor to:

determine if a field of said previous DPM indicates said packet is said duplicate packet, using said PSV; and

determine if a field of said current DPM indicates said packet is said duplicate packet, using said PSV.

63. (Original) The network device of claim 62, wherein said computer code is further configured to cause said processor to:

indicate said packet is not said duplicate packet, if said field of said previous DPM indicates said packet is not said duplicate packet and said field of said current DPM indicates said packet is not said duplicate packet, and

indicate said packet is said duplicate packet, otherwise.

64. (Original) The network device of claim 61, wherein said computer code is further configured to cause said processor to:

select said previous DPM as an inactive DPM;

select said current DPM as said previous DPM; and

select another DPM of said DPMs as said current DPM.

65. (Original) The network device of claim 64, wherein

said computer code further configured to cause said processor to select said previous DPM as said inactive DPM, said computer code further configured to cause said processor to select said current DPM as said previous DPM, and said computer

code further configured to cause said processor to select said another DPM of said DPMs as said current DPM are further configured to be performed periodically.

66. (Original) The network device of claim 65, wherein

a period of said performing periodically is such that said period is greater than an expected differential between duplicate packet arrivals and said period is less than a time between packet retransmissions.

67. (Original) The network device of claim 65, wherein

a period of said performing periodically is configured to allow said inactive DPM to be cleared prior to said inactive DPM being selected as said current DPM.

68. **(Currently Amended)** A computer **computer-readable storage medium storaing a computer** program product comprising:

a computer-readable storage medium,

a first set of instructions, executable on a computer system **and stored in said computer-readable storage medium**, configured to determine if a field of a duplicate packet map (DPM) indicates a packet is ~~said~~ **a** duplicate packet, wherein said DPM is one of a plurality of DPMs included in a DPM bank and

said first set of instructions ~~makes said determination using~~ **is configured to determine if said field of said duplicate packet map indicates said packet is said duplicate packet using** a packet summary value (PSV) corresponding to said packet, and

said DPM comprises a previous time interval field and a current time interval field;

an eighth set of instructions, executable on said computer system, configured to generate said packet summary value (PSV), wherein

said eighth set of instructions comprises instructions configured to cause said processor to, responsive to receiving said packet, extract data from said packet, and

calculate said PSV using said data from said packet; and

computer readable storage media, wherein said computer program product is encoded in said computer readable storage media.

69. (Original) The computer program product of claim 68, further comprising:
a second set of instructions, executable on said computer system, configured to indicate said packet is said duplicate packet, if said computer code configured to cause said processor to determine determines said packet is said duplicate packet.

70. (Original) The computer program product of claim 69, further comprising:
a third set of instructions, executable on said computer system, configured to compare said PSV to said DPM.

71. (Original) The computer program product of claim 69, further comprising:
a third set of instructions, executable on said computer system, configured to select said field of said DPM based on said PSV.

72. (**Currently Amended**) The computer program product of claim 71, further comprising:
a fourth set of instructions, executable on said computer system, configured to generate said PSV by virtue of being configured to ~~**generate**~~ **calculate** a cyclic redundancy check value based on ~~**information**~~ **said data** in said packet**, wherein said data from said packet excludes header and trailer information, and said data from said packet is path-independent**.

73. (Cancelled)

74. (Previously Presented) The computer program product of claim 68, further comprising:
a second set of instructions, executable on said computer system, configured to select a first DPM of said DPMs as a previous DPM; and
a third set of instructions, executable on said computer system, configured to select a second DPM of said DPMs as a current DPM.

75. (Original) The computer program product of claim 74, further comprising:

a fourth set of instructions, executable on said computer system, configured to determine if a field of said previous DPM indicates said packet is said duplicate packet, using said PSV; and

a fifth set of instructions, executable on said computer system, configured to determine if a field of said current DPM indicates said packet is said duplicate packet, using said PSV.

76. (Original) The computer program product of claim 75, further comprising:

a sixth set of instructions, executable on said computer system, configured to indicate said packet is not said duplicate packet, if said field of said previous DPM indicates said packet is not said duplicate packet and said field of said current DPM indicates said packet is not said duplicate packet, and

a seventh set of instructions, executable on said computer system, configured to indicate said packet is said duplicate packet, otherwise.

77. (Original) The computer program product of claim 74, further comprising:

a fourth set of instructions, executable on said computer system, configured to select said previous DPM as an inactive DPM;

a fifth set of instructions, executable on said computer system, configured to select said current DPM as said previous DPM; and

a sixth set of instructions, executable on said computer system, configured to select another DPM of said DPMs as said current DPM.

78. (Original) The computer program product of claim 77, wherein

said fourth, said fifth, and said sixth set of instructions are performed periodically.

79. (Previously Presented) The computer program product of claim 78, wherein

a period of said performing periodically is such that said period is greater than an expected differential between duplicate packet arrivals and said period is less than a time between packet retransmissions.

80. (Previously Presented) The computer program product of claim 78, wherein

a period of said performing periodically is configured to allow said inactive DPM to be cleared prior to said inactive DPM being selected as said current DPM.

81. (**Currently Amended**) An apparatus comprising:

means for generating a packet summary value (PSV), wherein

said means for generating said PSV comprises means for, responsive to receiving a packet,

extracting data from said packet, and

calculating said PSV using said data from said packet; and

means for determining if a field of a duplicate packet map (DPM) indicates a packet is a duplicate packet, wherein said DPM is one of a plurality of DPMs included in a DPM bank and

said means for determining uses ~~**a packet summary value (PSV)**~~ **said PSV, wherein said PSV** corresponds to said packet, and

said DPM comprises a previous time interval field and a current time interval field;

means for indicating said packet is said duplicate packet, said means for indicating configured to indicate said packet is said duplicate packet if said means for determining determines said packet is said duplicate packet; and

means for selecting said field of said DPM based on said PSV.

82. (Cancelled)

83. (Previously Presented) The apparatus of claim 81, wherein said determining comprises:

means for comparing said PSV to said DPM.

84. (Cancelled)

85. (**Currently Amended**) The apparatus of claim 81, ~~**further comprising**~~ **wherein**:

said means for generating said PSV ~~**comprising a**~~ **further comprises** means for

~~**generating**~~ **calculating** a cyclic redundancy check value based on ~~**information**~~ **said data** in said packet**, wherein**

the data from said packet excludes header and trailer information, and the data from said packet is path-independent.

86. (Cancelled)

87. (Previously Presented) The apparatus of claim 81, further comprising:
means for selecting a first DPM of said DPMs as a previous DPM; and
means for selecting a second DPM of said DPMs as a current DPM.

88. (Original) The apparatus of claim 87, further comprising:
means for determining if a field of said previous DPM indicates said packet is said duplicate packet, using said PSV; and
means for determining if a field of said current DPM indicates said packet is said duplicate packet, using said PSV.

89. (Original) The apparatus of claim 88, further comprising:
means for indicating said packet is not said duplicate packet, if said field of said previous DPM indicates said packet is not said duplicate packet and said field of said current DPM indicates said packet is not said duplicate packet, and
means for indicating said packet is said duplicate packet, otherwise.

90. (Original) The apparatus of claim 87, further comprising:
means for selecting said previous DPM as an inactive DPM;
means for selecting said current DPM as said previous DPM; and
means for selecting another DPM of said DPMs as said current DPM.

91. (Original) The apparatus of claim 90, further comprising:
means for clearing said inactive DPM prior to said inactive DPM being selected as said current DPM.

92. (Original) The apparatus of claim 90, wherein
said means for selecting said previous DPM as said inactive DPM, said means for selecting said current DPM as said previous DPM, and said means for selecting

said another DPM of said DPMs as said current DPM perform their respective selections periodically.